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CARBON FINANCE AND THE FOREST SECTOR IN NORTHEAST INDIA

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Abbreviations and acronyms

CDM	clean development mechanism
CER	certified emission reduction
UNFCCC	United Nations Framework Convention on Climate Change
VER	verified emission reduction

Overview of Paper

Carbon finance mechanisms established under the Kyoto Protocol provide financial compensation for projects that either reduce or sequester emissions of greenhouse gases. The focus of this Background Paper is on assessing the scope for harnessing these funds to address the developmental and environmental needs of the Northeastern Region of India. The Paper begins with a brief overview of the historical genesis of carbon finance and then provides broad assessments of the carbon finance potential of the region at the macroeconomic level. It concludes with an overview of the processes and mechanisms for securing carbon funds.

1. Introduction to carbon finance

The sheer size of the Indian economy has made it the fifth largest emitter of greenhouse gases worldwide, though in per capita terms the country emissions are lower than for most developed countries.[1] Paradoxically this offers wide opportunities for the country to participate in the carbon trading business in ways that address both the economic and environmental needs of the country. Carbon finance can be used to improve the efficiency and pollution intensity of production and sequester carbon through restoration of degraded forests and the establishment of new forest areas. The genesis of these opportunities lies in the concerns about climate change that culminated in the Kyoto Protocol.

1.1 The Kyoto Protocol

On 16 February 2005, the Kyoto Protocol, an international and legally binding agreement to reduce greenhouse gas emissions worldwide, entered into force. The Kyoto Protocol, which supplements the United Nations Framework Convention on Climate Change (UNFCCC),[2] commits Parties listed in Annex I to the Convention (industrialized countries) to a reduction in their carbon emissions by an average of 5.2 percent below their 1990 levels in the period 2008–2012 (UNFCCC 2002).[3] The Protocol is highly principled and recognizes that climate change is a consequence of emissions from the developed world and therefore places the burden of emission reductions on these countries. But to come into play the Kyoto Protocol required that 55 countries would need to ratify the agreement and that the greenhouse gas emissions of the

[1] The current gross carbon dioxide emissions per capita in India are only one-sixth of the world average at 0.93 metric tons per annum (www.teriin.org).

[2] In June 1992, over 180 countries at the United Nations Conference on Environment and Development (the Earth Summit) in Rio de Janeiro adopted the United Nations Framework Convention on Climate Change (UNFCCC), a legal framework that commits Parties to the Convention to start the process of stabilizing climate-altering greenhouse gases in the atmosphere (www.carbonfinance.org).

[3] According to a press release from the United Nations Environment Programme: "The Kyoto Protocol is a legally binding agreement under which industrialized countries will reduce their collective emissions of greenhouse gases by 5.2% compared to the year 1990 (but note that, compared to the emissions levels that would be expected by 2010 without the Protocol, this target represents a 29% cut). The goal is to lower overall emissions from six greenhouse gases – carbon dioxide, methane, nitrous oxide, sulphur hexafluoride, HFCs, and PFCs – calculated as an average over the five-year period of 2008–12. National targets range from 8% reductions for the European Union and some others to 7% for the US (although they did not ratify the Protocol), 6% for Japan, 0% for Russia, and permitted increases of 8% for Australia and 10% for Iceland." (en.wikipedia.org/wiki/Kyoto_Protocol).

ratifying countries totaled at least 55 percent of developed countries' 1990 emissions.[4] By October 2004, 126 countries had ratified or approved the treaty, including all 15 countries of the European Union, Japan, Canada, and New Zealand (though not the United States of America or Australia). The greenhouse gas emissions of these countries totaled 44.2 percent of developed countries' 1990 emissions. The target of 55 percent was reached when Russia ratified the agreement in November 2004, 90 days after which the Protocol became effective. Currently, with 141 countries included, the Kyoto Protocol represents over 61 percent of global greenhouse gas emissions.

Why are greenhouse gases important? When carbon-based fossil fuels are burned, greenhouse gases such as carbon dioxide (CO_2), methane (CH_4), and nitrogen dioxide (NO_2) are emitted. These gases are collected in the atmosphere and as more fossil fuels are burned, the layer of gases thickens. Solar radiation passes through unimpeded but, when reflected from the earth, finds it harder to escape back into space and is therefore trapped within the atmosphere. The unpredictable climate dynamics that result have been termed global climate change (CO2e.com 2005).

The precise impacts of climate change are hard to identify so there remains some uncertainty as to the effects in India. However, there is strong indication that melting of glaciers in the Himalayas is one of the major effects of climate change, which will impact the country's hydrological potential. Though models differ in their predictions, there is also consensus that India will be affected by "increasing variability of already highly variable rainfall patterns" (World Bank 2005).

1.2 Carbon trading mechanisms under the Kyoto Protocol

The industrialized countries that have ratified the Kyoto Protocol are required to achieve a significant element of their emission reduction efforts domestically. Domestic efforts, however, can be supplemented through three international market-based mechanisms:

- Joint implementation, whereby an industrialized country may acquire emission reduction units when it helps to finance projects that reduce emissions in another industrialized country (including economies in transition)
- The clean development mechanism (CDM), which allows developing countries to achieve sustainable development by permitting industrialized countries to finance greenhouse gas reduction projects in developing countries and receive credit for doing so.[5]
- Emissions trading, which provides for industrialized countries to acquire units[6] from other countries and use them towards meeting their emission targets under the Kyoto Protocol. This enables the countries to make use of lower-cost opportunities to reduce emissions, irrespective of the country in which those opportunities exist.

[4] In order to ratify the Kyoto Protocol, a country must sign the treaty and make it part of its domestic law.

[5] Currently, there are no obligations on developing countries to reduce their emissions.

[6] The tradable unit is metric ton units of CO_2 emission reductions, or CO_2 equivalent emission reductions. Carbon dioxide equivalents (CO_2e) provide a universal standard of measurement against which the impacts of releasing different greenhouse gases can be evaluated. Every greenhouse gas has a global warming potential (GWP), a measurement that describes its effect on climate change relative to a similar amount of CO_2.

Of these it is only the CDM that applies to India. As a signatory to the Kyoto Protocol and a developing country, India is classified as a non-Annex I Party, implying that it is not required to make any commitments to reduce greenhouse gases, but may volunteer to cooperate with the process. The primary mechanism for participation is the CDM, which allows other countries to finance emission reductions or carbon sequestration in India. It is worth emphasizing that CDM transactions are voluntary and are expected to occur only if they benefit the host nation (in this case India) sufficiently.

Another opportunity for India is to sell carbon credits on the official European market (www.newvalues.nl/) or in the pilot markets of countries that have not ratified the Kyoto Protocol.[7] Examples of this are the Chicago Climate Exchange (www.chicagoclimateexchange.com) for emission sources and offset projects in the United States, Canada, and Mexico; or the Australasian Emissions Trading Forum (www.aetf.emcc.net.au) for the Australian, New Zealand, and Asian market. For northeast India, these mechanisms could be a promising source of additional income.

[7] A carbon credit is normally quantified in terms of "carbon dioxide equivalent (CO_2e)". This enables conversion of the different forms of carbon into a common unit – carbon dioxide.

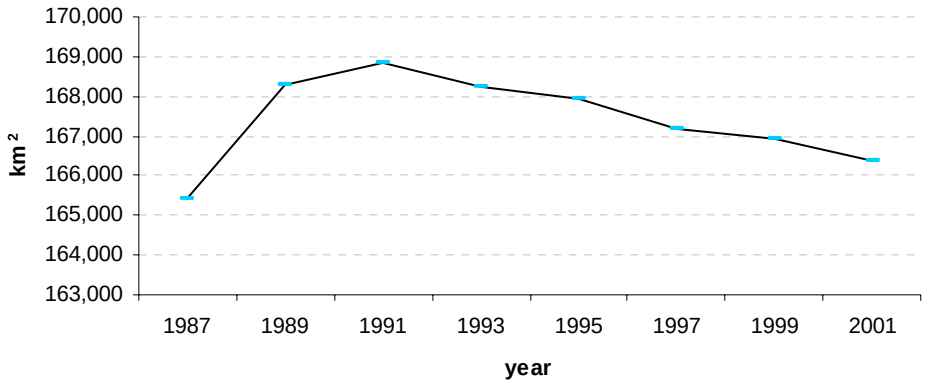
2. Potential for carbon finance: Forest resources

As in many areas faced with increasing population pressures and development, northeast India's forests face unrelenting pressures resulting in degradation and deforestation (Barik and others 2005; Roy and Joshi 2002). Overexploitation due to the shortening cycle of shifting cultivation is assumed to be the core driver of this forest degradation and depletion, but the contribution of other factors – illegal logging, infrastructure development, and encroachment – is also important. Not only is valuable biodiversity being lost, but so too are the benefits of forest functions such as purification of water, regulation of the water flow, and stabilization of soil erosion, in addition to climate change benefits. The CDM could provide an opportunity to secure funds to restore the region's degraded forests and establish new areas of forest cover. To assess the carbon finance potential, it is useful to begin by reviewing the official forest cover statistics of northeast India.

2.1 Forest cover in northeast India

A review of the forest cover statistics of northeast India reveals some unexpected and contradictory trends (for more detail see appendix A). Data from the Forest Survey show an increase in forest cover of 3,398 square kilometers, an annual rate of 0.5 percent, for northeast India between 1987 and 1991, and a steady reduction in forest cover of 2,443 square kilometers, an annual rate of 0.15 percent, during the 1991–2001 period (see figure 1 and table 1). This increase between 1987 and 1991 seems to contradict the general perception of steady forest loss during the last decades (Barik and others 2005; Roy and Joshi 2002).

Figure 1. Northeast India: Changes in forest cover 1987–2001



Source: Ministry of Environment and Forests.

Table 1. Percentage annual change in forest cover 1987–2001 by state

	87–89	89–91	91–93	93–95	95–97	97–99	99–01	91–01
	Percentage change							
Arunachal Pradesh	3.73	–0.18	–0.07	–0.03	–0.01	0.18	–0.58	0.42

	87–89	89–91	91–93	93–95	95–97	97–99	99–01	91–01
Assam	–0.65	–0.16	–0.49	. .	–1.41	–0.29	1.74	–0.18
Manipur	0.60	. .	–0.18	–0.18	–0.40	–0.10	–0.74	–0.14
Meghalaya	–2.52	0.73	–0.33	–0.17	–0.18	–0.08	–0.16	–0.39
Mizoram	–2.42	1.86	–0.41	–0.32	0.53	–1.17	–2.33	–0.62
Nagaland	0.02	–0.27	0.09	–0.20	–0.25	–0.20	–2.93	–0.54
Sikkim	5.04	. .	1.27	0.13	0.03	–0.18	1.20	0.29
Tripura	–3.57	. .	0.03	. .	0.07	1.78	10.89	3.09
NE India total	**0.87**	**0.15**	**–0.17**	**–0.10**	**–0.23**	**–0.08**	**–0.16**	**–0.54**

. . Zero or insignificant.

Source: Ministry of Environment and Forests, various years.

State-level data provide a clearer indication of the regional trends. The data reveal, for the period 1987–1989, a near 4 percent and over 5 percent increase in forest cover in Arunachal Pradesh and Sikkim respectively. This seems implausible since natural regeneration processes are typically considerably slower. Equally improbable is the annual growth rate for Tripura, which is recorded at almost 11 percent between 1999 and 2001.

The reasons for this sudden expansion in forest cover are unclear, though it is suggested that the data reflect changes in methodology and scale. For instance the 2001 data include all lands with a tree canopy density of more than 10 percent, irrespective of land use. Thus tea plantations, agroforestry plantations, and fruit orchards are all defined as forests. In addition, a number of districts previously ignored have been included in the assessments, which probably leads to some increases. Hence the Ministry of Environment and Forests cautions against temporal comparisons as "technique and scale of interpretation were both different" (Ministry of Environment and Forests 2001).

Table 2. Open and dense forest developments: 1997, 1999, and 2001

	1997	1999	2001	1997	1999	2001
State	**Open forest (sq. km)**			**Dense forest (sq. km)**		
Arunachal Pradesh	14,447	11,091	14,113	54,155	57,756	53,932
Assam	8,276	9,171	11,884	15,548	14,517	15,830
Manipur	12,481	11,448	11,366	4,937	5,936	5,762
Meghalaya	11,613	9,708	9,903	4,044	5,925	5,681
Mizoram	14,427	14,552	8,558	4,348	3,786	8,936
Nagaland	9,728	9,027	7,952	3,421	5,137	5,393
Sikkim	706	755	802	2,423	2,363	2,391
Tripura	3,727	3,517	3,602	1,819	2,228	3,463
Northeast India	**75,405**	**69,269**	**68,180**	**90,695**	**97,648**	**101,388**

Source: Ministry of Environment and Forests.

A comparison of open and dense forests over time (see table 2) reveals an increase in dense forests for most states, while the open forests are declining. This too seems contrary to most other assessments (including GIS data) that forest degradation is on the rise. Notwithstanding these concerns, the overall picture presented by the official statistics is one of rapidly regenerating expanding forest cover, suggesting that environmental concerns and pressures on forests are being addressed.

2.2 Forest statistics and carbon finance

There is a popular perception that the biological potential for carbon finance in the forest sector of the Northeast is substantial (Poffenberger 2001; Poffenberger 2002; Caruso 2005). However, to qualify for CDM assistance certain conditions need to be satisfied. The principal requirement relates to the nature of land use prior to 1990. For an area to qualify for CDM funding, it must be convincingly demonstrated that it has *not* had forests since 1990.[8] The CDM is defined under Article 12 of the Kyoto Protocol, and the following definitions guide the allocation of CDM funds:

"The eligibility of land use, land use change and forestry project activities under Article 12 is limited to afforestation and reforestation."

Under the Kyoto Protocol, afforestation is defined as:

"The direct human-induced conversion of land that has not been forested for a period of at least 50 years to forested land through planting, seeding and/or the human-induced promotion of natural seed sources."

And reforestation is defined as:

"The direct human-induced conversion of non-forested land to forested land through planting, seeding and/or the human-induced promotion of natural seed sources, on land that was forested but that has been converted to non-forested land. For the first commitment period, reforestation activities will be limited to reforestation occurring on those lands that did not contain forests on December 31, 1989."

This has major implications for the Northeast. First, afforestation can only be pursued in areas that have not been forests[9] or defined as forests for at least 50 years. Second, in order to be eligible for reforestation, areas cannot have had forests after 1990. This means that projects involving rehabilitation of forestland that was degraded to less than 10 percent forest cover

[8] This provision was introduced to address fears that natural forests could be destroyed and CDM funds used to establish plantations of lesser biological significance.

[9] Under the UNFCCC a forest is defined under afforestation/deforestation activities as: "A minimum area of land of 0.05–1.0 hectares with tree crown cover (or equivalent stocking level) of more than 10–30 percent with trees with the potential to reach a minimum height of 2–5 meters at maturity in situ. A forest may consist either of closed forest formations where trees of various storeys and undergrowth cover a high proportion of the ground or open forest. Young natural stands and all plantations which have yet to reach a crown density of 10–30 percent of tree height of 2–5 meters are included under forest, as are areas normally forming part of the forest area which are temporarily unstocked as a result of human intervention such as harvesting or natural causes but which are expected to revert to forest."

after 1990 do not qualify for funding, nor do projects that involve avoidance of deforestation.[10] In addition, areas that have had less than 10 percent forest cover, but were officially defined as forests since 1990, are not eligible either.

Land areas that are suitable for CDM reforestation are therefore those that are not forested or do not include degraded forests. This implies that the CDM can only be used for reforestation on wasteland, farmland, fallow land, revenue, panchayat, or gomal land, or other land that was not classified as forest prior to 1990. The National Action Plan for Operationalising CDM in India (Planning Commission 2003) gives an overview of the suitability of the different land categories (see table 3). Table 4 shows the corresponding land areas. To guard against exaggeration the estimates are based on the lowest surface area recorded for each category between 1992 and 2002.

Table 3. Suitability of land categories, potential area, and activities under CDM

Eligibility[a]	Land categories	Examples of potential activities
Eligible (if tree cover < 10 percent and not a forest prior to 1990)	• Wastelands covering several land categories • Farmland (cropland) • Fallow land • Revenue/panchayat/gomal land	• Mixed species plantation • Assisted natural regeneration • Joint forest management type revegetation • Farm forestry • Commercial timber plantations (if biodiversity is protected) • Fruit tree orchards (mango, tamarind, jackfruits, etc.)
Not eligible	• Lands with tree cover > 10 percent and classified as forests • Degraded forest with < 10 percent tree cover but defined as forest in the past, although no trees currently • Cropland	• Forest conservation • Protected area formation • Gap filling in forests[b] • Natural regeneration in forestland • Timber treatment • Agroforestry

a. Eligibility of forestland depends on the definition of "forest" in India.

b. Sometimes open spots or gaps appear in forests where trees have fallen.

Source: Planning Commission 2003.

Table 4. Land use areas by state in northeast India (smallest area between 1992 and 2002)

	Net area sown	Fallow, pasture & culturable	Total land available for

[10] During the 28 November to 9 December 2005 United Nations Climate Conference held in Montreal, Canada, the possibility was discussed to allow certain countries to use carbon finance for avoidance of deforestation. However, whether this will indeed be allowed and by when has not been decided yet.

		wasteland area	forest conversion
	thousand hectares		
Arunachal Pradesh	150	74	224
Assam	2,706	447	3,153
Manipur	140	. .	140
Meghalaya	201	697	898
Mizoram	65	268	333
Nagaland	204	315	519
Sikkim	95	83	178
Tripura	277	6	283
Northeast India	**3,838**	**1,890**	**5,728**

. . Zero or insignificant.

Source: Land Use Statistics, Ministry of Agriculture, Govt. of India (www.indiastat.com).

The potential for establishing forests in wastelands remains uncertain as many of these areas include land that is unsuitable for trees with high carbon sequestration capabilities. On the other hand, farmland is likely to be more suitable for establishing trees and would also qualify for CDM funding. Furthermore, if funding is sufficient the conversion of marginal farms to forests may provide opportunities for poor farmers to diversify into more profitable activities. The following sections therefore assess the scope for diversifying land use on farmland using the CDM.

2.3 The benefits and costs of agricultural land conversion

The analysis is based on the profitability of farming in Assam, the only state for which relevant data are available. The Ministry of Agriculture provides estimates of the production cost and profitability for the three main crops: jute, paddy, and rapeseed/mustard seed (2000–2002). Table 5 presents a summary of the data. Financial net benefits are defined as income minus "all actual expenses in cash and kind incurred in production by the owner" (Ministry of Agriculture 1991, 2000). This, however, excludes all the costs incurred for land and labor (both own labor and hired labor). The figure is thus representative of the profitability of the smaller farmers who neither hire labor nor rent land. The next column presents the economic costs that show net benefits, including the opportunity costs of land and assets, hired labor, and imputed family labor. This is the more realistic figure and reflects the true economic cost of agricultural activities and should therefore be used for comparison against alternative land uses.

Table 5. Agricultural net present benefits

	Financial net benefits	Economic net benefits
	US$ per hectare per year	
Jute	225	27.7
Paddy	192	16.3
Rapeseed/mustard seed	88	–53.4

Jute provides the highest returns, followed by paddy and rapeseed. In the case of rapeseed and mustard seed, the opportunity costs outweigh the benefits by US$53, indicating that these are marginal crops grown on land with limited opportunity for diversification into higher-value commodities. The prevalence of oilseed production across India is partly sustained by the high degree of protection afforded by tariffs on imported oilseeds.[11]

The financial benefits of converting agricultural land into forest will vary with the sequestration capacity of the forest and the prevailing market price. To capture this uncertainty Table 6 presents a range of estimates.[12] These show the range of expected revenue from conversion.

Looking at the net present value of forest conversion (table 6),[13] it was calculated that a low carbon price[14] and low sequestration[15] would just about outweigh the costs of establishing a natural forest at US$0.6 per hectare. When the low carbon price prevails, but the sequestration level is high, the benefits increase to US$6.1 per hectare. The high carbon price is realizing benefits under the low sequestration scenario at US$4.4 per hectare, while the high sequestration increases them to US$31.9.

Table 6. Forest conversion net present value

	Low carbon price	High carbon price
	(US$ per hectare per year)	
Low sequestration	0.6	4.4
High sequestration	6.1	31.9

A number of interesting conclusions emerge from comparing tables 5 and 6.[16] First, if decisions are based on the financial benefits that exclude land and labor costs then the conversion of agricultural land to forests does not seem profitable under any scenario. The true opportunity costs, however, alter the calculus and the conversion of jute and paddy to forest becomes

[11] Rapeseed is grown for its oil and meal, and as a cover crop. Rapid growth captures part of the available soil nitrogen, which otherwise might be lost to leaching, and provides good ground cover during wintertime. Rapeseed produces large amounts of biomass and is good at suppressing weeds. Its root system can help loosen plow pans and improve soil tilth. This might clarify why these oilseeds are still grown despite their negative returns.

[12] Pasture land takes up less than 5 percent in Assam, and in the other states it is mainly nil. Therefore it was left out of the calculations of the opportunity cost of carbon sequestration benefits. In addition, income generation on fallow land and culturable wasteland is either nil or negligible and was also left out of the agricultural benefits calculation.

[13] Calculated over 20 years (generally 10 to 15 years, but for forest projects 20 years is more realistic, although the benefits will go down the longer the project period as risks go up for the borrower), with an interest rate of 10 percent, and costs of establishing a natural regeneration forest of US$8 per hectare (Ravindranath and others 2001).

[14] US$4 per metric ton of carbon was used as a low carbon price, and US$10 per metric ton of carbon sequestration as a high price (World Bank; www.carbonfinance.org).

[15] Low sequestration was considered to be 0.5 metric ton of carbon per hectare, high sequestration 3.4 metric tons of carbon per hectare (Ravindranath and others 2001).

[16] One of these simplifications is that officially, the calculations need to reduce the emission reductions from forests by the baseline carbon sequestration from agriculture to capture the true additional benefits from a carbon offset project (this is called additionality). However, a study by Aune, Alemu, and Gautam (2005) stated that carbon accumulation in maize and rice monocropping in Nepal was negligible and therefore it was left out in this analysis.

profitable in the high sequestration and high price scenario. Since the production of rapeseed and mustard seed generates (true) economic losses, it indicates that switching to paddy or other crops is probably not feasible on land devoted to rapeseed production. In this case conversion to forests remains profitable under most scenarios. The same holds for permanent pastures and other grazing land, culturable wasteland, and fallow lands – all of which generate low returns.

The overall conclusion appears to be that the conversion of marginal farms to forests via the CDM provides the greatest potential to increase rural incomes and generate simultaneous environmental benefits. However, insofar as these farms are typically small and spatially dispersed this is likely to increase the transactions costs of CDM projects. But the CDM does include simplified monitoring procedures for small-scale projects. This means that requirements for project design documents are reduced; baseline methodologies and monitoring plans are simplified; the same operational entity may undertake validation, verification, and certification; and the CDM Executive Board may propose a lower share of proceeds to cover administrative costs and registration fees (Mackensen 2003).

It should be noted that the analysis presented in this section is rudimentary and highly aggregated. It does not include a variety of environmental benefits that play an important role in determining the social benefits of reforestation. These derive from the functions forests provide with respect to biodiversity, soil erosion prevention, purification of water, regulation of water flow, and stabilization of soils, in addition to the climate change benefits they bring.

2.4 Reclassification of forest areas

Under the current definition of forests the scope for carbon finance in the forest sector is unlikely to be large. However, the CDM recognizes the need for flexibility and allows countries to redefine land as forests so long as the definition meets certain minimum criteria (see footnote 9).

This creates new opportunities for the CDM to be used in areas that are currently legally classified as forests, but which in reality may include barren land or degraded forest cover. The CDM protocol simply requires that the government inform the Executive Board of its chosen definition and the mechanisms it intends to use to identify eligible areas for CDM activities. Suggested verification techniques include:

- Soil analysis: By analyzing the soil and root structure information can be obtained on type of land use.
- Aerial and other photographic evidence: Photos over different time periods since 1990 can demonstrate land status.
- Testimonies: Of people with knowledge of the land cover.

For a country as large and ecologically diverse as India the biologically appropriate definition of forests should vary by ecoregion and reflect climatic, topographic, and biological characteristics of natural forests typical of the area. For the Northeast the CDM funding potential can be maximized if the definition allows for high crown density and height. Appropriate areas can be readily identified through comparative assessments of forest cover changes using the widely available aerial maps of the region. However, in the absence of an agreed definition it is impossible to quantify the financial opportunities that could emerge from the CDM. Further assessments must await government decisions.

3. Implementation of clean development mechanisms

This section reviews procedural issues related to the implementation of clean development mechanisms.

3.1 Criteria and rules for participation in the CDM

The following rules and modalities have to be complied with to participate in the CDM (Planning Commission 2003):

- The host and investor countries should have ratified the Kyoto Protocol. India is a so-called non-Annex I Party. Non-Annex I Parties are mainly developing countries that have signed the Protocol and are not committed to undertake any emission reductions, but have agreed to cooperate by assisting in the monitoring and measuring of greenhouse gas emissions. So India does not have to comply with the Kyoto Protocol emission standards, but it can participate in CDM activities to help countries that have commitments to achieve their goals.
- Participation by all parties involved must be voluntary.
- The host country must establish a national authority for the CDM. India has established its designated national authority – the National Clean Development Mechanism Authority. Each project proposal should include written approval of voluntary participation from the designated national authority of each country and confirmation that the project activity assists the host country in achieving sustainable development.
- Project activities starting after 1 January 2000 are eligible to earn certified emission reductions (CERs).
- Projects should lead to "real, measurable, and long-term" greenhouse gas reductions, which are additional to any that would occur in the absence of the CDM project. A project is considered additional if the project emissions are lower than the emissions of a reasonable reference case, identified as the baseline.
- Public funding from Annex I countries for CDM projects should be additional to official development assistance and financial obligations under the Kyoto Protocol.
- CDM project activities should lead to the transfer of environmentally safe and sound technology and know-how. However, it is the host country's prerogative to ascertain whether a proposed CDM project assists it in achieving its sustainable development goals.
- Emission reductions resulting from CDM projects have to be certified by independent third parties known as designated operational entities (see section 3.2 below).
- Small-scale project categories have been defined that are eligible for fast-track procedures (including simplified baseline and monitoring requirements).[17]

[17] See UNFCCC 2001, page 9, paragraph 6 (a)–(c) and paragraph 7. Small-scale projects are defined as (a) renewable energy project activities with a maximum output capacity equivalent of up to 15 megawatts (or an appropriate equivalent); (b) energy efficiency improvement project activities which reduce energy consumption, on the supply or

Not all of these rules might be clear at this point, but will be explained in the upcoming sections.

3.2 Key entities involved in CDM project

In addition to the above-mentioned conditions, the Legal Issues Guidebook of the United Nations Environment Programme (UNEP 2004) identifies the different entities that are involved in CDM projects and their roles and responsibilities. Each project might define its own specific roles regarding these entities, but their general responsibilities may be defined as follows:

Project participants. The role of the project participants is to develop and implement the CDM project, monitor emission reductions, and deliver the CERs to the buyer of those credits.

CDM Executive Board. The Executive Board, which is a global entity, develops the rules and procedures for CDM operations, accredits designated operation entities, reviews validation and certification reports, registers projects, and eventually issues CERs.

Designated national authority (host country government). The designated national authority decides on the sustainable development criteria, confirms voluntary participation of project participants, confirms the sustainable development contribution of the projects, and issues a letter of approval to validate and register projects under the CDM.

Designated operational entity. The designated operational entity is either a domestic legal entity or an international organization accredited and designated, on a provisional basis until confirmed by the Meeting of the Parties to the Kyoto Protocol and by the Executive Board. It has two key functions:

- It validates and subsequently requests registration of a proposed CDM project activity, which will be considered valid after eight weeks if no request for review has been made.
- It verifies the emission reduction of a registered CDM project activity, certifies it as appropriate, and requests the Executive Board to issue CERs accordingly.

CER purchaser. The purchaser of CERs from a project potentially provides underlying debt or equity finance to the project and could also be a project participant.

Considering the roles and responsibilities of each of these entities, there are considerable risks involved that have to be overcome before a CDM project can be called successful.

3.3 Finding a buyer

There are several ways to find buyers for the CERs a project will generate or has generated. They include the following (UNEP 2004):

- Include the project in the competitive tender process of a large buyer.
- Check markets, for example at www.chicagoclimatex.com or www.climex.com, which is part of www.newvalues.net, to obtain insight into the demand for CERs.

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demand side, by up to the equivalent of 15 gigawatt-hours per year; or (c) other project activities that both reduce anthropogenic emissions by sources and that directly emit less than 15 kilotons of carbon dioxide equivalent annually. These definitions are subject to review by the Executive Board, which can recommend changes to the Meeting of the Parties to the Kyoto Protocol.

- Approach potential buyers with a project description to propose investment in a project.
- Negotiate with independent brokers to transact the project-generated CERs on the market.

To facilitate the adaptation of carbon finance transactions in developing countries, the World Bank and the Global Environment Facility also manage several funds that can be tapped for finance of projects that generate carbon finance credits. These funds primarily trade on voluntary markets for emission reductions that are not compliant with the Kyoto Protocol, for sale to corporations and individuals who want to offset their emissions for nonregulatory purposes. Emission offsets in this latter category are verified by independent verifiers, but are not certified by a regulatory authority for use as a compliance instrument, and are commonly referred to as verified emission reductions (VERs) (as distinct from certified emission reductions, CERs).

3.3.1 World Bank

The World Bank's carbon finance initiatives are part of the larger global effort to combat climate change, and the mission to reduce poverty and improve living standards in the developing world. The threat climate change poses to long-term development and the ability of the poor to escape from poverty is of particular concern. The impacts of climate change could unravel many of the development gains of the last decades.

The World Bank's objective is to catalyze a global carbon market through the purchase of high-quality emission reductions in climate-friendly projects in developing countries and countries with economies in transition. As such, carbon finance is the first large-scale initiative that seeks to catalyze private sector investments to address a global environmental issue. The World Bank's carbon finance products relevant to northeast India reforestation projects (obtained from the World Bank carbon finance website www.carbonfinance.org) are:

Prototype Carbon Fund. A partnership between 17 companies and 6 governments, managed by the World Bank, the Prototype Carbon Fund became operational in April 2000. As the first carbon fund, its mission is to pioneer the market for project-based greenhouse gas emission reductions while promoting sustainable development and offering a learning-by-doing opportunity to its stakeholders. Funds: US$180 million until 2012 (fully committed).

Netherlands Clean Development Facility. The World Bank announced an agreement with the Netherlands in May 2002, establishing a facility to purchase greenhouse gas emission reduction credits. The facility supports projects in developing countries that generate potential credits under the CDM. So far capitalization stands at around €136 million, or approximately US$180 million (fully committed).

Community Development Carbon Fund. The Community Development Carbon Fund provides carbon finance to small-scale projects in the poorer areas of the developing world. The fund, a public-private initiative designed in cooperation with the International Emissions Trading Association and the UNFCCC, became operational in July 2003. The first tranche of the fund is capitalized at US$128.6 million with 9 governments and 15 corporations and other organizations participating, and it is closed to further subscriptions. The fund supports projects that combine community development attributes with emission reductions to create "development plus carbon", and will use financial innovation to improve the lives of the poor.

BioCarbon Fund. The World Bank has mobilized a new fund to demonstrate projects that sequester or conserve carbon in forests and agro-ecosystems. The BioCarbon Fund, a public-private initiative administered by the World Bank, aims to deliver cost-effective emission reductions while promoting biodiversity conservation and poverty alleviation. The fund started operations in May 2004 and its first tranche has a total capital of US$53.8 million.

Italian Carbon Fund. In fall 2003 the World Bank entered into an agreement with the Ministry for the Environment and Territory of Italy to create a fund to purchase greenhouse gas emission reductions from projects in developing countries and countries with economies in transition that may be recognized under such mechanisms as the Kyoto Protocol's CDM and joint implementation mechanism. The fund is open to the participation of Italian private and public sector entities. Funds are currently at US$15 million.

Spanish Carbon Fund. The Spanish Carbon Fund was created in 2004 in an agreement between the Ministries of Environment and Economy of Spain and the World Bank. This fund was established to purchase greenhouse gas emission reductions from projects developed under the Kyoto Protocol to mitigate climate change while promoting the use of cleaner technologies and sustainable development in developing countries and countries with economies in transition.

Danish Carbon Fund. The Danish Carbon Fund became operational in January 2005 and is open to the participation of Danish public and private sector entities. The current participants in the fund are the Danish Ministry of Environment and Ministry of Foreign Affairs and the two leading power companies Energi E2 and Elsam. The fund will build knowledge and understanding of the flexible mechanisms of the Kyoto Protocol and implementation of projects among the participants through their engagement in the activities of the fund. The fund will also help build Danish private and public sector capacity to meet Danish climate obligations arising from the Kyoto Protocol. Funds are about US$30 million.

Special Climate Change Fund. The Special Climate Change Fund, a component of Japan's Policy and Human Resources Development Fund, provides grants to recipient country's government entities to (a) support the inclusion of climate change concerns in the country's development planning process and acquisition of knowledge in assessment of the impact of local greenhouse gas emissions in the recipient country; and (b) support initiatives, including pilot activities, for the reduction of greenhouse gas emissions as developing countries increase energy production to improve standards of living and promote industrial growth as they move towards eradication of poverty. Proposals must be linked to World Bank-financed operations or activities supported by the Prototype Carbon Fund, the BioCarbon Fund, and the Global Environment Fund, or other environmental funds managed by the World Bank.

3.3.2 Global Environment Facility

In addition to the World Bank, the Global Environment Facility also manages funds that can help finance climate change activities.

Global Environment Facility Trust Fund. The Global Environment Facility is one of the main funding channels for climate change projects in developing countries. Since 1991, approximately US$1.8 billion has been provided in grants from its Trust Fund to climate change activities. An additional amount of more than US$9 billion has been leveraged through cofinancing from bilateral agencies, recipient countries, and the private sector. Over the reporting period 1 July 2003 to 30 June 2004, total project financing for climate change activities exceeded US$678 million, of which the Global Environment Facility provided US$217 million in grant financing.

Special Climate Change Fund. The purpose of the Special Climate Change Fund is to finance activities, programs, and measures relating to climate change that are complementary to other activities funded within the climate change focal area of the Global Environment Facility, in such areas as adaptation; technology transfer and capacity building; energy, transport, industry, agriculture, forestry, and waste management; and activities to assist developing countries diversify their economies, particularly those highly dependent on income from fossil fuel (for example those in the Organization of the Petroleum Exporting Countries). The fund was established under UNFCCC. It has been granted around US$450 million a year starting from 2005.

Least-Developed Countries Fund. The Least-Developed Countries Fund was set up to support a special work program for least-developed countries. This fund is being used, in the first instance, to assist such nations to carry out their respective national adaptation plans of action. These are expected to be completed within the next year or two and will help countries identify the priority actions needed for adaptation to climate change. This fund was established under UNFCCC and has received around US$10 million from Canada.

Kyoto Protocol Adaptation Fund. The purpose of the Kyoto Protocol Adaptation Fund is to finance concrete adaptation projects and programs in developing countries that are Parties to the Protocol (non-Annex I Parties), including such adaptation activities as avoidance of deforestation and combating land degradation and desertification. The fund will be financed using proceeds arising from the CDM, in the order of 2 percent of CER and other sources of funding. The fund is likely to enter into force at an upcoming Meeting of the Parties (FAO 2004).

3.4 Project cycle and responsible entities

In order to go from initiating a carbon finance project to receiving CERs that can be traded, there are several steps to take. Table 7 gives a simplified overview of the 10 steps involved and who is responsible for each phase.

Table 7. Ten steps of the project cycle and responsible entities

	Phase of project cycle	Responsible entities
1	Project idea note	Project developers
2	Carbon finance document	Project developers
3	Project design document	Project developers (with consultants' assistance)
4	Approval/endorsement	Designated national authority
5	Validation	Designated operational entity
6	Registration	CDM Executive Board
7	Implementation[a]	Project promoters
8	Monitoring	Project promoters

9	Verification & certification	Designated operational entity
10	Issuance of CERs	CDM Executive Board

a. A critical step is the development of a new methodology when decided to do so.

Source: Planning Commission 2003 and Pommier 2005 (personal communication).

It should be kept in mind that the fifth step, validation, includes participation requirements, environmental impact assessment, baseline, emissions reduction, monitoring, and verification plan and the stakeholder comments.

The procedures shown above have to be applied to all CDM projects, except the small-scale projects. These projects can use the simplified and streamlined procedures that will allow them to reduce time and transaction costs for the project.

4. Conclusions

Reviewing the rules of the CDM and the data for northeast India, there are two broad conclusions that emerge. On the one hand forestry projects have the possibility to generate at least as much income as low-earning agricultural production, although the scale of benefits obviously depends to a great extent on the price of the carbon credits. The CDM would provide income both to the farmer and to the government (by reducing subsidies) as well as generating global climate change benefits and other environmental benefits mentioned.

However, there are many hurdles to overcome before a carbon finance project can be initiated. Even if the transaction cost issue is overcome, there is still the question whether farmers would be willing to convert to this type of forestry livelihood and have the capacity to establish and maintain it. The capacity of national and local institutions to facilitate the transition is another crucial issue to be tackled and something that should not to be underestimated.

The greatest benefits from the CDM are likely to emerge if the government were to evoke the forest reclassification clauses. This opens up new opportunities for the CDM in areas now classified as "forest".

Overall, it seems that carbon finance is an opportunity for India to harness win-win benefits for the economy and the environment. As more projects are initiated, the generated experience and information can reduce the transaction costs. It is recommended that the focus should not be specifically on stand-alone projects, but rather on activities that complement projects that deal for example with land degradation, watershed issues, and species and biodiversity conservation to create greater benefit and opportunity. Carbon funding could be responsible for tipping the balance towards having such projects not only benefiting the local and global environment but also generating benefits for local land users and owners.

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Appendix A. Detailed forest analysis

India forest statistics have been available since 1987 through periodic satellite-based forest monitoring programs implemented by the Forest Survey of India.[18] The Forest Survey prepares comprehensive state of forest reports, published every two years since 1987. The statistics in this appendix are obtained both from the State of Forest Report (Ministry of Environment and Forests 1999) and from the Indiastat website (www.indiastat.com). Although state-level data are shown for 1987 onwards, district-level data are only available after 1993. Note that from 1987 to 1999, forest cover was assessed by visually interpreting the most up-to-date satellite data at a scale of 1:250,000, obtained from the National Remote Sensing Agency in Hyderabad. The State of Forest Report 2001, however, used digital interpretation of satellite data at 1:50,000 scale (Ministry of Environment and Forests 2001). As discussed below, this difference in techniques has implications for interpreting the forest statistics.

According to the data of the Forest Survey, there was an increase in forest cover of 3,398 square kilometers between 1987 and 1991 for northeast India as a whole, an annual rate of 0.5 percent, and a steady reduction in forest cover of 2,443 square kilometers in the 1991–2001 period, an annual rate of 0.15 percent (see figure 1 and table 1). The increase between 1987 and 1991 seems to contradict the general perception of a steady loss of forest in recent decades (Barik and others 2005).

Figure A1. Northeast India: Changes in forest cover 1987–2001

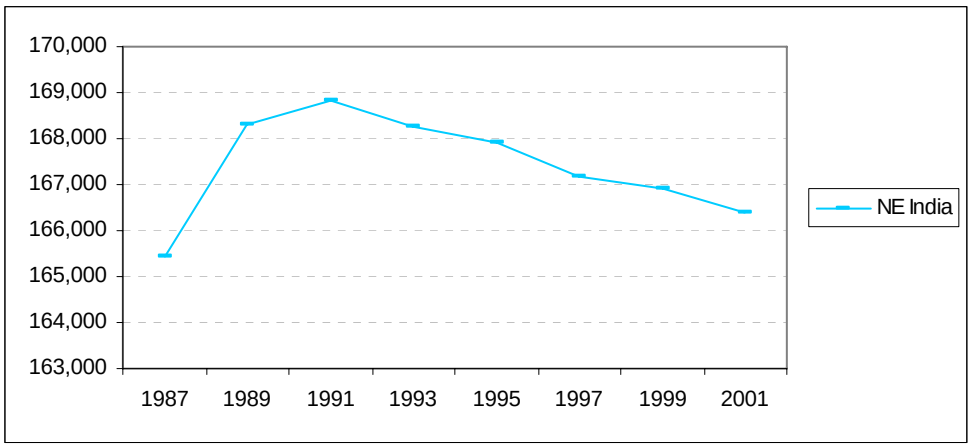


Table A1. Forest cover by state (square kilometers)

	1987	1989	1991	1993	1995	1997	1999	2001
Arunachal Pradesh	64,132	69,002	68,757	68,661	68,621	68,602	68,847	68,045
Assam	25,160	24,832	24,751	24,508	24,508	23,824	23,688	24,521
Manipur	17,475	17,685	17,685	17,621	17,558	17,418	17,384	17,128
Meghalaya	16,466	15,645	15,875	15,769	15,714	15,657	15,633	15,584

[18] Created in 1981. See also http://envfor.nic.in/fsi/fsi.html.

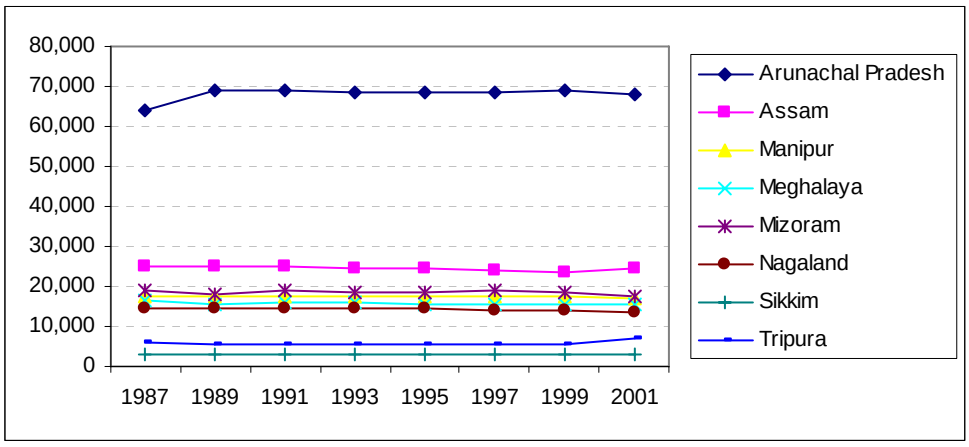
	1987	1989	1991	1993	1995	1997	1999	2001
Mizoram	19,084	18,170	18,853	18,697	18,576	18,775	18,338	17,494
Nagaland	14,394	14,399	14,321	14,348	14,291	14,221	14,164	13,345
Sikkim	2,756	3,041	3,041	3,119	3,127	3,129	3,118	3,193
Tripura	5,953	5,535	5,535	5,538	5,538	5,546	5,745	7,065
NE India	**165,420**	**168,309**	**168,818**	**168,261**	**167,933**	**167,172**	**166,917**	**166,375**

Source: Ministry of Environment and Forests, various years.

To have a better sense of where exactly the increase in forest cover took place up to 1991, it is necessary to look at the state-level statistics (figure 2). Increases in Arunachal Pradesh of 4,870 square kilometers and in Sikkim of 285 square kilometers between 1987 and 1989, or annual growth of 3.7 percent and 5 percent respectively, are the main drivers of the growth during this time period. Manipur and Nagaland contributed to a lesser extent with just slight increases in their forest cover, while Tripura experienced a 3.6 percent and Meghalaya and Mizoram around 2.5 percent annual decline during this time. Between 1989 and 1991, much more moderate changes can be seen as only in Mizoram did forest cover increase appreciably, at 1.9 percent per year, with Meghalaya's at 0.7 percent. Other states show either a slight decline or a constant level of forest resulting in a slight net increase in forest cover in northeast India as a whole during this two-year time period.

Between 1991 and 1993, except for Nagaland, Sikkim, and Tripura, forests in all states were either stable or declining, with Assam decreasing 0.5 percent per year experiencing the fastest forest loss, and northeast India as a whole losing 557 square kilometers or 0.17 percent per year. The years 1993 to 1995 had similar developments to the previous two assessments: only Assam's forest cover was stable, Nagaland had a reduction in forested area, but Sikkim's increase slowed down, reducing the forest loss of the Northeast as a whole to an annual 0.1 percent. The next two-year period, 1995–1997, showed the forest cover in Mizoram increasing, while forest loss was largest in Assam at nearly 1.5 percent per year. The Northeast as a whole lost 0.23 percent of forest per year during this period.

Figure A2. Forest cover by state (km²)



Source: Ministry of Environment and Forests, various years.

From 1997 to 1999, Arunachal Pradesh and Tripura were the only states with forest increases, the overall decline for the region as a whole being 0.08 percent per year. In the next two-year period, Tripura's statistics really seem to go out of control: the state apparently increases its forests by 1,320 square kilometers, or 10.9 percent per year, and while Assam also improves its forest cover by 833 square kilometers, the overall decline for the Northeast is still 0.16 percent per year, due to the over 2 percent and close to 3 percent decline in Mizoram and Nagaland respectively.

Appendix B. Transaction costs

Transaction costs are generally differentiated into preimplementation, implementation, and trading costs.

Transaction cost components	**Description**
Project-based preimplementation costs	
Search costs (fixed)	Costs incurred by investors and hosts as they seek out partners for mutually advantageous projects
Negotiation costs (degressive)	Costs related to the preparation of project design document, public consultations with key stakeholders
Baseline determination costs (fixed)	Development of a baseline (consultancy)
Approval costs (fixed)	Costs of authorization from host country
Validation costs (fixed)	Review and revision of project design document by operational entity
Review costs	Costs of reviewing a validation document
Registration costs (fixed)	Registration by UNFCCC Executive Board
Project-based implementation costs	
Monitoring costs (fixed)	Costs to collect data
Verification costs (degressive)	Costs to hire an operational entity and to report to the UNFCCC Executive Board
Review costs	Costs of reviewing a verification
Certification costs (degressive)	Issuance of CERs by UNFCCC Executive Board
Enforcement costs (proportional)	Costs of administrative and legal measures incurred in the event of departure from the agreed transaction
Trading costs	
Transfer costs	Brokerage costs
Registration costs	Costs to hold an account in national registry

Source: Michaelowa and Stronzik 2002, in Mackensen 2003.

Appendix C. Crop prices

Procurement / minimum support / statutory minimum prices

Fixed by the government for agricultural commodities in absolute terms (as on 12.2.2001)

(According to crop year)

(Rs. per quintal)

YEAR 1995-96 to 2000-01

CROP	1995-96		1996-97		1997-98		1998-99		1999-2000		2000-01	
Paddy	360	(5.9)	380	(5.6)	415	(9.2)	440	(6.0)	490	(11.4)	510	(4.1)
Jowar	300	(7.1)	310 (3.3)		360	(16.1)	390	(8.3)	415	(6.4)	445	(7.2)
Bajra	300	(7.1)	310	(3.3)	360	(16.1)	390	(8.3)	415	(6.4)	445	(7.2)
Maize	310	(6.9)	320	(3.2)	360	(12.5)	390	(8.3)	415	(6.4)	445	(7.2)
Ragi	300	(7.1)	310	(3.3)	360	(16.1)	390	(8.3)	415	(6.4)	445	(7.2)
Wheat	380	(5.6)	475X	(25.0)	510Y (7.4)	(7.4)	550	(7.8)	580	(5.5)		
Barley	295	(3.5)	305	(3.4)	350	(14.8)	385	(10.0)	430	(11.7)		
Tur(Arhar)	800	(5.3)	840	(5.0)	900	(7.1)	960	(6.7)	1105	(15.1)	1200	(8.6)
Moong	800	(5.3)	840	(5.0)	900	(7.1)	960	(6.7)	1105	(15.1)	1200	(8.6)
Urad	800	(5.3)	840	(5.0)	900	(7.1)	960	(6.7)	1105	(15.1)	1200	(8.6)
Gram	700	(4.5)	740	(5.7)	815	(10.1)	895	(9.8)	1015	(13.4)		
Groundnut-in- shell	900	(4.7)	920	(2.2)	980	(6.5)	1040	(6.1)	1155	(11.1)	1220	(5.6)
Soyabean Black	600	(5.3)	620	(3.3)	670	(8.1)	705	(5.2)	755	(7.1)	775	
SoyabeanYellow	680	(4.6)	700	(2.9)	750	(7.1)	795	(6.0)	845	(6.3)	865	(2.4)
Sunflower seed	950	(5.6)	960	(1.1)	1000	(4.2)	1060	(6.0)	1155	(9.0)	1170	(1.3)
Rape & Mustard	860	(3.6)	890	(3.5)	940	(5.6)	1000	(6.4)	1100	(10.0)		
Toria	825	(3.1)	855	(3.6)	905	(5.8)	965	(6.6)	1065	(10.4)		
Safflower	800	(2.6)	830	(3.8)	910	(9.6)	990	(8.8)	1100	(11.1)		
Cotton	1150	(15.0)	1180	(2.6)	1330	(12.7)	1440XX	(8.3)	1575xx	(9.4)	1625xx	(3.2)
	1350	(12.5)	1380	(2.2)	1530	(10.9)	1650	(7.8)	1775	(7.6)	1825	(2.8)
Jute	490	T(4.3)	510 T	(4.1)	570	(11.8)	650	(14.0)	750	(15.4)	785	(4.7)
Sugarcane #	42.50	(8.7)	45.90	(8.0)	48.45	(5.6)	52.70	(8.8)	56.10	(6.5)		
Tobacco(VFC) Black	19.00	(2.7)	19.00	(-)	20.50	(7.9)	22.50	(9.8)	25.00	(11.1)	26.00	(4.0)

Soil												
Light Soil (Rs.per kg.)	21.50	(2.4)	22.00	(2.3)	23.50	(6.8)	25.50	(8.5)	27.00	(5.9)	28.00	(3.7)
Copra Milling	2500	(6.4)	2500	(st)	2700	(8.0)	2900	(7.4)	3100	(6.9)	3250	(4.8)
(For Calendar Year) Ball	2725	(5.8)	2725	(st)	2925	(7.3)	3125	(6.8)	3325	(6.4)	3500	(5.3)
Sesamum	850	-	870	(2.4)	950	(9.2)	1060	(11.6)	1205	(13.7)	1300	(7.9)
Niger Seed	700	-	720	(2.9)	800	(11.1)	850	(6.3)	915	(7.6)	1025	(12.0)

(According to crop year)

(Rs. per quintal)

YEAR 1989-90 to 1994-95

CROP	1989-90		1990-91		1991-92		1992-93		1993-94		1994-95	
Paddy	185.00	(15.6)	205.00	(10.8)	230.00	(12.2)	270	(17.4)	310	(14.8)	340	(9.7)
Jowar	165.00	(13.8)	180.00	(9.1)	205.00	(13.9)	240	(17.1)	260	(8.3)	280	(7.7)
Bajra	165.00	(13.8)	180.00	(9.1)	205.00	(13.9)	240	(17.1)	260	(8.3)	280	(7.7)
Maize	165.00	(13.8)	180.00	(9.1)	210.00	(16.7)	245	(16.7)	265	(8.2)	290	(9.4)
Ragi	165.00	(13.8)	180.00	(9.1)	205.00	(13.9)	240	(17.1)	260	(8.3)	280	(7.7)
Wheat	215.00	(17.5)	225.00	(4.7)	275.00	@(22.2)	330	@(20.0)	350	(6.1)	360	(2.9)
Barley	180.00	(24.1)	200.00	(11.1)	210.00	(5.0)	260	(23.8)	275	(5.8)	285	(3.6)
Tur(Arhar)	425.00	(18.1)	480.00	(12.9)	545.00	(13.5)	640	(17.4)	700	(9.4)	760	(8.6)
Moong	425.00	(18.1)	480.00	(12.9)	545.00	(13.5)	640	(17.4)	700	(9.4)	760	(8.6)
Urad	425.00	(18.1)	480.00	(12.9)	545.00	(13.5)	640	(17.4)	700	(9.4)	760	(8.6)
Gram	421.00	(29.5)	450.00	(6.9)	500.00	(11.1)	600	(20.0)	640	(6.7)	670	(4.7)
Groundnut-in-shell	500.00	(16.3)	580.00	(16.0)	645.00	(11.2)	750	(16.3)	800	(6.7)	860	(7.5)
Soyabean Black	325.00	(18.2)	350.00	(7.7)	395.00	(12.9)	475	(20.3)	525	(10.5)	570	(8.6)
SoyabeanYellow	370.00	(15.6)	400.00	(8.1)	445.00	(11.3)	525	(18.0)	580	(10.5)	650	(12.1)
Sunflower seed	530.00	(17.8)	600.00	(13.2)	670.00	(11.7)	800	(19.4)	850	(6.3)	900	(5.9)
Rape & Mustard	575.00	(25.0)	600.00	(4.3)	670.00	(11.7)	760	(13.4)	810	(6.6)	830	(2.5)
Toria	545.00	(26.7)	570.00	(4.6)	645.00	(13.2)	725	(12.4)	780	(7.6)	800	(2.6)
Safflower	550.00	(25.0)	575.00	(4.5)	640.00	(11.3)	720	(12.5)	760	(5.6)	780	(2.6)
Cotton	570.00	(14.0)	620.00	(8.8)	695.00	(12.1)	800	(15.1)	900	(12.5)	1000	(11.1)

	690.00	(15.0)	750.00	(8.7)	840.00	(12.0)	950	(13.1)	1050	(10.5)	1200	(14.3)
Jute	295.00	T(18.0)	320.00	T(8.5)	375.00	T(17.2)	400	T(6.7)	450	T(12.5)	470	T(4.4)
Sugarcane #	22.00	(12.8)	23.00	(4.5)	26.00	(13.0)	31.00	(19.2)	34.50	(11.3)	39.10	(13.3)
Tobacco(VFC) Black Soil	12.50	(6.4)	13.25	(6.0)	14.75	(11.3)	16.00	(8.5)	18.00	(12.5)	18.50	(2.8)
Light Soil (Rs.per kg.)	13.50	(5.5)	14.25	(5.6)	16.00	(12.3)	17.50	(9.4)	20.00	(14.3)	21.00	(5.0)
Copra Milling	1500.00		1600.00	(6.7)	1700.00	(6.3)		N.A.	2150		2350	(9.3)
(For Calendar Year) Ball					1850.00			N.A.	2350		2575	(9.6)
Sesamum												
Niger Seed												

(#) - For a basic recovery of 8.5% with a proportionate premium of every 0.1% increase above that level.

(T - TD-5) - in Nowgong Assam.

(N.A). - Not Announced. St- Steady.

(@) - Including a Central Bonus of Rs. 25.00 per quintal.

(X) - Including a Central Bouns of Rs. 60.00 per quintal payable on wheat offered for sale to the procurement agencies for central pool upto 30.6.97.

(XX) - For J-34 variety also.

(Y) - Including a central Bonus of Rs. 55 per quintal payable on wheat offered for sale to the procurement agencies for central pool up to 30.6.98.

Note:-

1) FIGURES IN BRACKETS ARE THE PERCENTAGE INCREASE IN PROCUREMENT/MINIMUM SUPPORT PRICES OVER THE PREVIOUS YEAR.

2) FROM 1991-92 FIGURES RELATE TO MINIMUM SUPPORT PRICES.

Source:
www.agriculture-industry-india.com/agricultural-price-policy/procurement-price-absolute.html.